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MODELING THE DETERMINANTS OF FINANCIAL LITERACY OF UNIVERSITY STUDENTS

This paper explores factors that affect the financial literacy of university students. A survey was administered to 442 university students to capture measures of financial knowledge, financial attitudes and financial behaviours along with several social and demographic factors. Results showed parental income, whether parents owned stocks or not, year of study, faculty enrolled in, and gender all influenced knowledge. Greater financial knowledge and financial attitude scores were found to have a positive influence on financial behaviour scores.

Introduction

As the financial landscape continues to increase in complexity, the importance of financial literacy becomes more and more essential for consumers. Previous studies have indicated that the general level of financial literacy around the world is poor (see Xu and Zia, 2012 for a summary of related research). Financial literacy is an important factor in determining life success and well-being (Shim, Xiao, Barber, and Lyons, 2009). Additionally, financial literacy has an impact on economic prosperity within communities (Commonwealth Bank Foundation, 2004).

Young adults are often the focus of financial literacy studies as they are at a stage in life where financial responsibility heightens. Lusardi, Mitchell, and Curto (2010) measured the financial literacy levels of 7,147 U.S. respondents between the ages of 23 and 28 and found that less than one third of respondents possessed basic financial literacy. Finding effective ways to increase financial literacy levels has been the focus of many previous studies. Marcolin and Abraham (2006) reviewed the literature and concluded that more research is needed to determine realistic benchmarks for the measurement of financial literacy. They argue that this will help to determine the validity of educational strategies to improve financial literacy within the school system.

In Canada, FCAC has actively been implementing programs to address low levels of financial literacy across the nation. In 2015, in collaboration with the Government of Canada, they released a nation-wide strategy. A National Steering Committee on Financial Literacy was created to keep the strategy on track and to measure progress. The Government of Canada secured a commitment from Canada's banks to establish a five-year Financial Literacy Partnership Fund of \$10 million. This funding will be provided to community groups with projects that aim to improve

financial literacy of Canadians. The three goals set out in this nationwide strategy include helping people to manage money and debt wisely, to plan and save for the future, and to protect against fraud and financial abuse. (National Strategy for Financial Literacy, 2017)

Our study makes an important contribution by testing a model of financial literacy that incorporates the concepts of financial knowledge, financial attitudes and financial behaviours. Modelling financial literacy is important because it will assist in identifying factors that affect financial literacy. This will allow researchers to better understand how it is acquired and to better understand how the dimensions of knowledge, attitude, and behaviour are related.

This paper will start with an overview of previous studies of financial literacy and the relevant findings. It will then discuss the data and methods used in this study followed by the results. Finally, a discussion of the findings and concluding remarks will be made.

Literature Review

The concept of financial literacy has been operationalized in different ways in the literature. In many studies, financial literacy is used interchangeably with financial knowledge. Although very closely connected and often used interchangeably, financial knowledge and financial literacy do not represent the same concept. This is a common misconception. Huston (2010) did an analysis of seventy-one studies published between 1996 and 2008 on the topic of financial literacy. He found that forty seven percent of the studies he analyzed used financial literacy and financial knowledge interchangeably. Financial literacy, however, is made up of more than just knowledge. It also includes how this knowledge is applied and the thoughts behind this application.

For this study, financial literacy is defined as the combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial wellbeing (Atkinson and Messy, 2012). Financial literacy can therefore be broken up into three separate parts: financial knowledge, financial attitude, and financial behaviour.

Financial knowledge is defined as the stock of knowledge acquired through formal education and experience (Huston, 2010). In attempts to measure financial knowledge, many studies have asked participants basic questions on a variety of financial topics faced by individuals daily. They cover the topics of time value of money, simple and compound interest, risk and return, inflation, and diversification (Atkinson and Messy, 2012). Financial attitude is often measured as short-term gratification versus long-term financial plans. A positive financial attitude is associated with the satisfaction of saving, making other long-term investments, and receiving financial benefits. In contrast, a negative financial attitude is related to satisfying short-term wants which avoids the practice of saving for the future (Atkinson and Messy, 2012). The final component that makes up financial literacy is the behaviour that people employ when making financial decisions. Someone may have superior knowledge of financial matters, but if their behaviour doesn't reflect this knowledge, then there may be no financial gain. Behaviour is, therefore, argued to be the most important element or dimension of financial literacy (Atkinson and Messy, 2012).

Conceptual model

Another major issue with previous research on financial literacy is the lack of theoretical models that capture the different dimensions of financial literacy (Potrich, Vieira and Mendes-Da-Silva, 2016), but this is changing. Recently Tang and Peter (2015) used Experiential Learning theory from the education literature to guide their study on how education and experience affect financial knowledge. In addition, Potrich, Vieira and Mendes-Da-Silva (2016) propose three different models to capture the relationship between the concepts of financial knowledge, attitudes and behaviours and financial literacy. In our study, we use the conceptual model for student financial well-being proposed by Shim et al (2009).

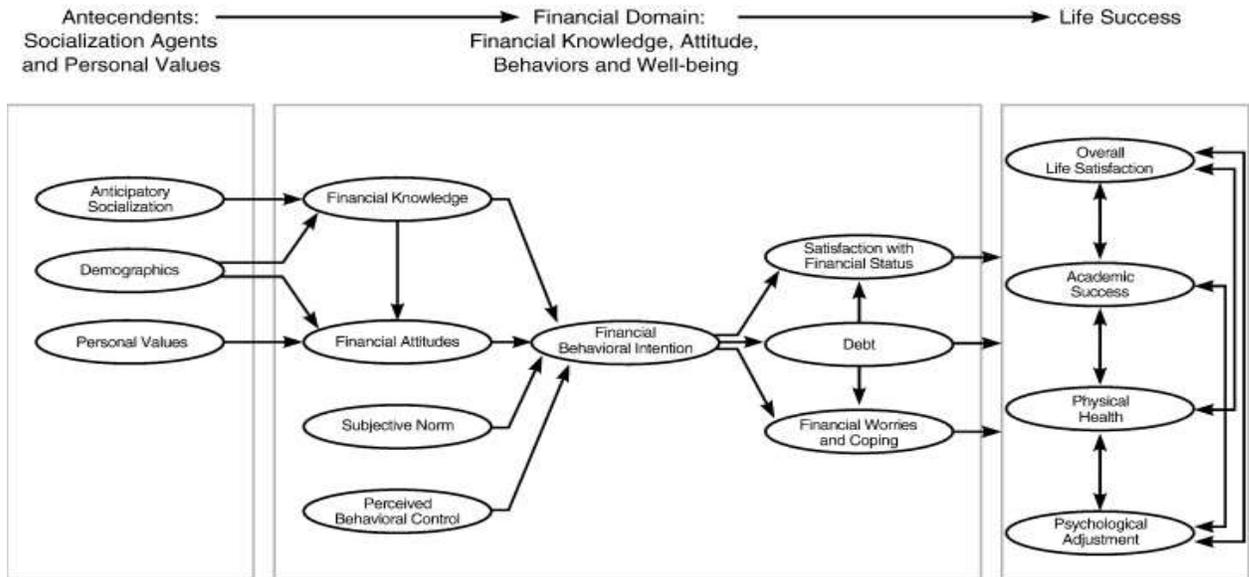


Figure 1. The proposed conceptual model of student financial well-being by Shim et al. (2009).

Shim et al. (2009) propose a model to examine financial well-being in young adults by connecting social agents and personal values to the financial domain, and connecting this measure to life success. The model is displayed in Figure 1. The proposed theory by Shim is that young adults' social and personal factors affect financial knowledge, attitudes and behaviours, which are in turn linked to overall life success. They found a direct link between financial knowledge, financial attitude, and financial behavior intentions. In addition to breaking out the components of financial literacy, Shim et al. (2009) also propose several sociodemographic variables which affect financial literacy levels. These include life-cycle stage, formal education, gender, and parental influences. Our study tests a reduced version of the Shim et al (2009) model as shown in Figure 2.

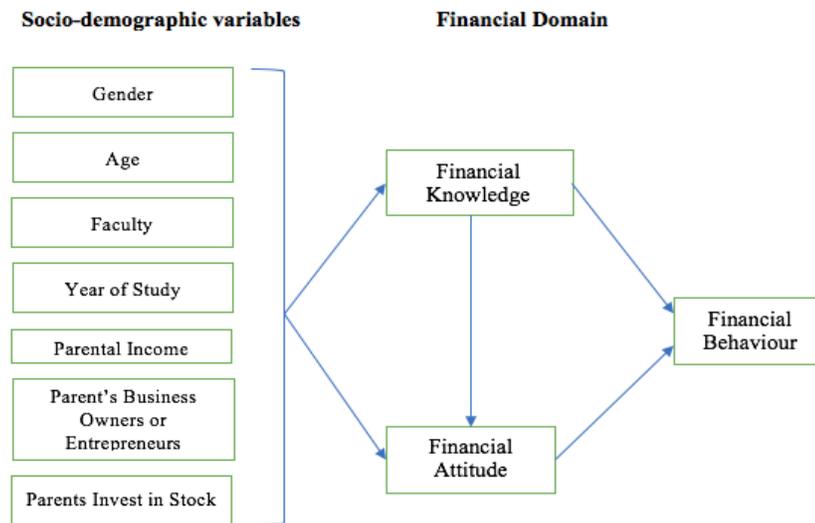


Figure 2. Proposed model of financial literacy

Hypotheses

Mitchell and Lusardi (2015) found that much of the variance in the financial literacy of students is explained by socio-economic factors. Several demographic variables, consistent with previous studies, therefore are included in this study.

Gender and Age

The difference in financial literacy levels for males and females is a commonly studied demographic factor. Fisher (2010) conducted a study on personal saving behaviours and specifically looked at the differences in these behaviours between genders. To eliminate influences from family or spouses, she focused on single person households. Consistent with previous literature she found that women were less likely to save over the previous year and that women are more risk averse than men. Additionally, Chen and Volpe (2002) found that women were less enthused, had lower confidence, and were less willing to learn about personal finance topics than were men. Age is also an important factor on levels of financial literacy. Xu and Zia (2012) found that financial literacy followed an inverted U-shape with respect to age. In the U.S., their review showed those in the 25 to 65 age group scored 5% better on financial literacy questions than those younger than 25 or older than 65.

Hypothesis 1: Males will have higher financial literacy scores than females.

Hypothesis 2: As age increases for students, financial literacy levels will also increase.

Program and Year of Study

Formal education has been found to impact financial literacy levels. Schuchardt, Hanna, Hira, Lyons, Palmer, and Xiao (2009) found that there is consistent evidence showing that financial education leads to increases in financial knowledge. Chen and Volpe (1998) surveyed 924 college students. They found that the participant's educational background has a significant impact on their financial knowledge. The results of the survey showed business students answering 60.72% of the questions correctly, while non-business majors answered 49.94% correctly. Additionally, Tang and Peter (2015) found a 12% increase in financial knowledge scores by those who chose finance related college majors. Year of study has been found to affect the level of financial literacy. Chen and Volpe (1998) found freshmen respondents had the lowest level of financial knowledge, where graduate level students scored the highest. Xu and Zia's (2012) review of the literature also found that financial literacy is associated with education.

Hypothesis 3: Business students will have higher financial literacy than non-business students.

Hypothesis 4: As year of study increases, financial literacy levels will also increase.

Parental Influences

The relationship between parental influences and test scores has also been found to influence financial literacy levels. Schuchardt et al. (2009) concludes that current literature identifies parents as primary agents for financial socialization. The main influences are parent's household income, whether parents are business owners or entrepreneurs, and whether they invest in stocks or not. Chen and Volpe (1998) reported results from their study that showed an increase in financial knowledge with a higher level of household income in the current year. Additionally, Mitchell and Lusardi (2015) found that more than one-third of U.S. wealth inequality can be explained by the differences in financial knowledge. It is also expected that those whose parents are either business owners or entrepreneurs would be exposed to money management talks at home, and their financial literacy would be higher than someone who was not exposed to this. Additionally, previous research has found that students whose parents owned stocks will score higher financial knowledge scores than those whose do not. Specifically, Lusardi et al (2010) found that participants whose parents owned stock were 8% more likely to answer a risk diversification question correctly.

Hypothesis 5: Students whose parents have a higher income will have higher financial literacy levels than those whose parents have a lower income.

Hypothesis 6: Students whose parents are business owners or entrepreneurs will have higher financial literacy than those whose parents are not.

Hypothesis 7: Students whose parents invest in stocks will have higher financial literacy than those whose parents have not.

Financial Knowledge, Attitude and Behaviour

Martin (2007) conducted a literature review on the effectiveness of financial education. He determined that there is a positive connection between financial knowledge and financial behaviour. In addition to demographic variables, Shim et al (2009) proposed that higher levels of financial knowledge are associated with better financial attitudes and improved financial behaviours. In addition, better financial attitudes are also associated with improved financial behaviours. This leads to the following three hypotheses.

Hypothesis 8: The higher the level of financial knowledge, the more positive the financial attitude will be.

Hypothesis 9: The higher the level of financial knowledge, the better the financial behaviour will be.

Hypothesis 10: The more positive the financial attitude, the better the financial behaviour will be.

Data and Methods

Participants and Procedure

A survey was administered to various classes at a small undergraduate university in eastern Canada. A total of 442 usable surveys were collected. The descriptive statistics for various demographic and socialization factors are highlighted in Table 1.

Table 1: Descriptive Statistics

Panel A: Summary statistics for demographic variables

Variable	N	Percent
<i>Gender</i>		
Male	261	60.0%
Female	176	40.0%
<i>Age</i>		
<18	3	0.7%
18	29	6.6%
19	91	20.6%
20	94	21.3%
21	106	24.0%
22	73	16.5%
23	25	5.7%
24	8	1.8%
25+	13	2.9%

<i>Faculty</i>		
BA	114	25.9%
BBA	297	67.4%
BSc	14	3.2%
Other	16	3.6%
<i>Year of Study</i>		
1 st	61	13.9%
2 nd	127	28.9%
3 rd	101	23.0%
4 th	128	29.1%
Other	23	5.2%
<i>Student Loan</i>		
Yes	159	36.0%
No	279	64.0%
<i>Parental Income</i>		
0-60,000	42	10.1%
60,001-90,000	89	21.3%
90,000-150,000	104	24.9%
More than 150,000	182	43.7%
<i>Parent is Business Owner or Entrepreneur</i>		
Yes	164	37.3%
No	276	62.7%
<i>Parents Invest in Stocks</i>		
Yes	253	57.5%
No	187	42.5%
<i>Student Debt</i>		
1 st year		\$ 10,959
2 nd year		\$ 18,560
3 rd year		\$ 22,309
4 th year		\$ 25,056
Other		\$ 32,778
Overall Average		\$ 21,932

Panel B: Summary Statistics for financial literacy variables

Variable	N	Mean	SD	Min	Max
Financial Knowledge	442	5.90	1.661	1	8
Financial Attitude	442	8.36	1.808	3	14
Financial Behaviour	442	5.01	1.853	0	9

Measure of Financial Knowledge

A set of knowledge questions taken from an OECD study by Atkinson and Messy (2012) was used to capture the dimension of financial knowledge. The list of questions and the scoring system for these questions can be found in Table 2. Several different topics and question types were used to capture an overall knowledge score for each participant. In their study, Atkinson and Messy explored the impact of omitting or including certain questions. Because of the advanced nature of the mortgage question, two composite scores were calculated for knowledge, one on an eight-point scale and one on a nine-point scale. The eight-point scale included all knowledge questions excluding the final advanced question on mortgages. The second measure included the mortgage question, and had a maximum knowledge score of nine. For this study, the score excluding the mortgage question was used in analysis, as the test subjects are students and have likely not encountered this situation at this point in their life.

Table 2: Financial Knowledge Composite Scoring System

Topic	Question Asked	Scoring Scheme
K1. Division	Imagine that five brothers are given a gift of \$1000. If the brothers have to share the money equally how much does each one get? [open response: \$200]	1 for correct response, 0 in all other cases
K2. Time-value of money	Now imagine that the brothers have to wait for one year to get their share of the \$1000. In one year's time will they be able to buy: a) More, b) the same amount, c) less than they could buy today d) it depends on the types of things they want to buy , or e) don't know	1 for correct response (c or d accepted), 0 in all other cases.
K3. Interest paid on loan	You lend \$25 to a friend one evening and he gives you \$25 back the next day. How much interest has be paid on his loan? [open response: 0]	1 for correct response, 0 in all other cases.

K4. Calculation of interest plus principle	Suppose you put \$100 into a no fee savings account with a guaranteed interest rate of 2% per year and the interest is paid at the end of each year. You don't make any further payments into this account and you don't withdraw any money. A) How much would be in the account at the end of the first year, once the interest payment is made? [open response: \$102]	1 for correct response, 0 in all other cases.
K5. Compound Interest	B) How much would be in this account at the end of five years, remembering that there are no fees? a) More than \$110 b) Exactly \$110 c) Less than \$110 d) not enough info or e) don't know	1 for correct response (a and d accepted) IFF the previous response was also correct, 0 in all other cases.
K6. Risk and Return	An investment with a high return is likely to be high risk. [true/false]	1 for correct response, 0 in all other cases.
K7. Definition of Inflation	High inflation means that the cost of living is increasing rapidly. [true/false]	1 for correct response, 0 in all other cases.
K8. Diversification	It is usually possible to reduce the risk of investing in the stock by buying a wide range of stocks and shares. [true/false]	1 for correct response, 0 in all other cases.

K9. Mortgage	A 15-year mortgage typically requires higher monthly payments than a 30 year mortgage but the total interest paid over the life of the loan will be less. [true/false]	1 for correct response, 0 in all other cases.
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Measure of Financial Attitude

Table 3 summarizes the questions asked and the scoring system to create a composite financial attitude score. Participants were asked to rank how strongly they agreed or disagreed with three statements on a scale of one to five, with one being strongly disagree and five being strongly agree. To make this composite score more easily understood, the responses were reverse scored. This allowed for high attitude scores to represent positive attitudes, without changing any of the meaning of the data collected. After this small change was made, a composite score was created for each survey by adding together the scores of the statements, with the highest possible score being 15. The questions and scoring scheme were taken from Atkinson and Messy's (2012) OECD study.

Table 3: Financial Attitude Composite Scoring System

Statement	Scoring Scheme
A1. I find it more satisfying to spend money than save it for the long term.	Scale of 1 to 5 used, where one was completely disagree with the statement and 5 is completely agree.
A2. I tend to live for today and let tomorrow take care of itself.	Scale of 1 to 5 used, where one was completely disagree with the statement and 5 is completely agree.
A3. Money is there to be spent.	Scale of 1 to 5 used, where one is completely disagree with the statement and 5 is completely agree.

Measure of Financial Behaviour

Financial behaviour questions were also taken from the Atkinson and Messy (2012) OECD study. Two composite behaviour scores were calculated, one having a maximum score of seven, the other of nine. The questions, answers and scoring system can be found in Table 4. The first score included the factor on credit cards and had a maximum score of 9, while the second did not include the credit card question and had a maximum score of 7. The seven point scale was created

over concerns that those without a credit card could not score 2 of the 9 points. Two scores were created to convey the financial behaviours of the participants. For this study, the 9-point score was used for analysis as the majority of respondents (74%) did own a credit card.

Table 4: Financial Behaviour Composite Scoring System

Topic	Question Asked	Scoring Scheme
B1. Considered Purchase	Before I buy something I carefully consider whether I can afford it.	A scale of 1-5 was used, 1 being completely disagree, 5 being completely agree. Responses of 4 or 5 were given one point, 0 in all other cases.
B2. Timely bill payment	I pay my bills on time.	A scale of 1-5 was used, 1 being completely disagree, 5 being completely agree. Responses of 4 or 5 were given one point, 0 in all other cases.
B3. Keeping watch on financial affairs	I keep a close personal watch on my financial affairs.	A scale of 1-5 was used, 1 being completely disagree, 5 being completely agree. Responses of 4 or 5 were given one point, 0 in all other cases.
B4. Long-term financial goal setting	I set long-term financial goals and strive to achieve them	A scale of 1-5 was used, 1 being completely disagree, 5 being completely agree. Responses of 4 or 5 were given one point, 0 in all other cases.
B5. Responsible and has a household budget	a) Who is responsible for day-to-day decisions about your money? b) Do you use a budget?	1 point if personally or jointly responsible for money management and uses budget often or always. 0 in all other cases.

B6. Borrowing to make ends meet	a) Sometimes people find that their funds do not quite cover their living costs. In the last 12 months has this happened to you? [Yes/No] b) What did you do to make ends meet the last time this happened	1 point if answer to (a) was no, 1 point if answer to (a) is yes <i>and</i> answer to (b) was that the respondent didn't borrow or use credit. 0 in all other cases.
B7. Active Saving	In the past 12 months have you personally saved money, whether or not you still have the money now? [Yes/No]	If the answer was yes, respondents were given 1 point. 0 in all other cases.
B8. Choosing products	a) If you have a credit card, are you solely responsible for making the payments on your credit card? [Yes/No/Don't have a credit card] b) Which of the following best describes how you last chose a credit card?	If respondents did not have a credit card they were given a 0. If respondents did own a credit card and considered several options from different companies they were given a 2. If respondents owned a credit card and considered various options from one company, they were given a 1. 0 in all other cases.

Analysis

Both univariate and multivariate techniques were used in the analyses. ANOVA was used to identify significant differences in knowledge, attitude and behaviour mean scores among various social and demographic variables. Post hoc Duncan tests were used to determine where the significant differences occurred. In addition, correlations were run to examine the relationships between financial knowledge, attitudes and behaviour in the model.

At the multivariate level, Partial Least Square (PLS) software was used. The model created using SmartPLS 2.0 was used to evaluate statistical relationships between the various constructs. Bootstrapping was used to test for significance of coefficients of the various paths. The sample size was set to 442, the number of surveys completed, and number of samples was set to 500 and verified with a set of 1000. Significance was determined with critical t-values of 1.96 ($p < 0.05$). Insignificant paths were removed from the model, leaving only statistically significant relationships in the final model. The degree to which two measures of construct were related was validated using the average variance extracted (AVE) for each latent variable and was then compared to the benchmark value of 0.5. Item loadings were also validated using a recommended benchmark of 0.5 for manifest variables, with only variables meeting this criterion remaining in the final model. Assessment of construct reliabilities was then done using composite reliability (CR) with a benchmark value of 0.7.

Results

Analysis of Variance

SPSS was used to run several univariate tests to identify significant relationships within the collected data and, where applicable, post hoc Duncan tests were used to identify differences among groups. The significant differences found are highlighted in Table 5 and discussed below.

Gender and Age

For financial knowledge, females scored significantly lower than males. Females scored an average of 5.27 out of a possible eight points, where males scored 6.36. For financial attitudes and financial behaviours, no significant differences were found between males and females. Scores for financial attitudes and financial behaviours were significantly different for different age groups but no pattern could be discerned. Details of the ANOVA results can be found in Table 5.

Program and Year of Study

Significant differences were found for faculty / program of study. The faculty variable was broken up into Bachelor of Arts, Bachelor of Business Administration, Bachelor of Science, and Other. The first significant difference was found for knowledge scores. Using a post hoc Duncan test, Bachelor of Arts students were found to score significantly lower than all other students. Bachelor of Arts students scored an average of 4.91 out of a possible eight points on the knowledge questions whereas Bachelor of Science students scored 5.86, 'Other' students scored 5.94 and Bachelor of Business students who scored 6.29. The second significant difference was found for financial behaviour scores, with Bachelor of Arts students scoring significantly lower in this category.

A significant difference was also found for year of study for financial knowledge scores but no pattern could be discerned.

Parental Influences

The parental influences on financial knowledge, attitude and behaviour were tested using parental income, whether parents were business owners or entrepreneurs, and whether parents owned stocks or not. Students whose parents' income is \$90,000 to \$150,000 scored significantly higher on the financial knowledge questions compared to their peers with parental incomes less than \$90,000. No significant differences were found for the different categories of parental income for financial attitude or financial behaviour. The presence of parents who were business owners or entrepreneurs showed no significant impact on knowledge, attitude, and behaviour scores. Whether parents invested in stocks did show a significant impact on financial knowledge levels, but no impact on attitude and behaviour scores. Students whose parents invested in stocks scored significantly higher on financial knowledge (6.11) than students whose parents did not invest in stocks (5.60).

Financial Knowledge, Financial Attitude, Financial Behaviour

Aside from the socio-demographic variables, the three dimensions of financial literacy were also found to be related (see Table 6). Significant correlations were found between financial behaviour and both financial knowledge and financial attitude. This provides preliminary evidence consistent with the assertion that financial behaviour may be impacted by both financial knowledge and financial attitudes.

Table 5: Results of Univariate Analysis

Variable	N	Knowledge	Attitude	Behaviour
<i>Gender</i>				
Male	261	6.36	8.31	5.28
Female	176	5.27	8.42	4.68
F-stat		5.51**	0.04	0.03
<i>Age</i>				
<18	3	5.00	9.00	3.67
18	29	5.28	9.14	4.52
19	91	5.87	8.10	5.04
20	94	5.90	8.22	4.95
21	106	5.93	8.43	5.29
22	73	5.85	8.08	4.63
23	25	6.76	8.12	5.88
24	8	5.13	9.38	4.00
25+	13	6.46	10.15	5.46
F-stat		1.91	3.37**	2.30*
<i>Faculty</i>				
BA	114	4.91	8.42	4.45
BBA	297	6.29	8.33	5.20
BSc	14	5.86	8.79	5.43
Other	16	5.94	8.06	5.38
F-stat		21.79***	0.47	5.13**
<i>Year of Study</i>				
1 st	61	5.34	8.62	4.80
2 nd	127	5.93	8.26	4.94
3 rd	101	5.62	8.25	4.92
4 th	128	6.22	8.38	5.27
5 th	17	6.76	8.88	4.47
Graduate	2	5.50	7.00	6.00
Other	4	6.25	8.25	6.75
F-stat		3.31**	0.77	1.57
<i>Parental Income</i>				
0-60,000	42	5.67	8.29	4.62
60,001-90,000	89	5.66	8.26	5.04

90,000-150,000	104	6.26	8.26	5.01
More than 150,000	182	5.93	8.34	5.09
F-stat		2.53*	0.22	0.72
<i>Parent is Business Owner/Entrepreneur</i>				
Yes	164	5.78	8.25	5.14
No	276	5.97	8.43	4.92
F-stat		1.30	1.07	1.40
<i>Parents invest in stock</i>				
Yes	253	6.11	8.38	5.06
No	187	5.60	8.34	4.93
F-stat		10.32**	0.06	0.60

*** p<0.001, ** p<0.01, * p<0.05

Table 6: Financial Knowledge, Attitude, and Behaviour Correlations

Variables	N	Pearson Correlation	Significance Level
Knowledge and Attitude	442	.000	.996
Knowledge and Behaviour	442	.186	.000
Attitude and Behaviour	442	.123	.010

PLS Model

Partial Least Squared (PLS) software was used to identify which socio-demographic factors had a significant effect on financial knowledge, attitudes, and behaviours and to identify the influential relationships between these financial factors. The bootstrapping function was used in order to identify the factors that had a significant impact on financial knowledge, attitudes, and behaviours. The PLS algorithm was then calculated to identify which variables were statistically significant for each latent variable, and the degree to which the variables were explained by the significant factors. Values greater than 0.5 were kept in the final model.

The results from the PLS bootstrapping model can be found in Figure 3. Five different factors were found to have a significant impact on knowledge scores. Parental income was one of the factors found to have a considerable impact on knowledge scores of the participants. Students whose parents had higher incomes scored higher on the financial knowledge questions. The next factor captured whether respondents were exposed to the idea and nature of stocks in their upbringing. Exposure to this aspect of finance was theorized to have a positive impact on levels of financial literacy. In the PLS model, this factor showed a significant and positive relationship with knowledge¹. Consistent with previous literature, gender was found to have a significant impact on levels of financial knowledge. The respondent's year of study was also found to impact the levels

¹ The negative sign in front of the coefficient of 0.139 is due to how the variable was coded.

of financial knowledge. Finally, faculty / program of study was shown to influence both financial knowledge and financial behaviour. Compared to other programs, BA students scored lower on both knowledge and behavior ($t=1.987$ and $t=3.220$ respectively).

The PLS model also highlighted the connections between the three factors of knowledge, attitude, and behaviour. Knowledge was shown to have a significant influence on both financial attitude and financial behaviour ($t= 2.390$ and $t=1.998$ respectively). Thus a participant's level of financial knowledge positively influences their financial attitudes and behaviours. A significant relationship was also found between attitude and behaviour. Attitude was found to have a very significant influence ($t=7.245$) on behaviours. This allows us to conclude that financial knowledge, attitude, and behaviour are in fact all connected.

After significant paths were identified, a PLS algorithm calculation was run (see Figure 4). This allowed for an R^2 value to be identified for each of the financial domain variables. R^2 values of 0.10 or greater ($R^2 \geq 0.10$) were kept in the final model, as this is the threshold for practical significance (Falk and Miller, 1992). The PLS algorithm calculation concluded that the latent variables of income, parental stocks, gender, year, and faculty explain 12.7% of the variance in knowledge scores. The R^2 for behaviours was found to be 0.160, showing practical significance. This means that 16.0% of the variance of the behaviour scores is explained by the influence of knowledge and attitude of participants. The R^2 value for attitude was originally found to be 0.014, which meant that the knowledge variable only explained 1.4% of variance of attitude. Although this relationship showed statistical significance in Figure 3, the R^2 value of 0.014 shows that there is no practical significance in this relationship. This relationship was removed from the PLS Model and the revised model can be found in Figure 4.

Figure 3. PLS Model-Bootstrapping

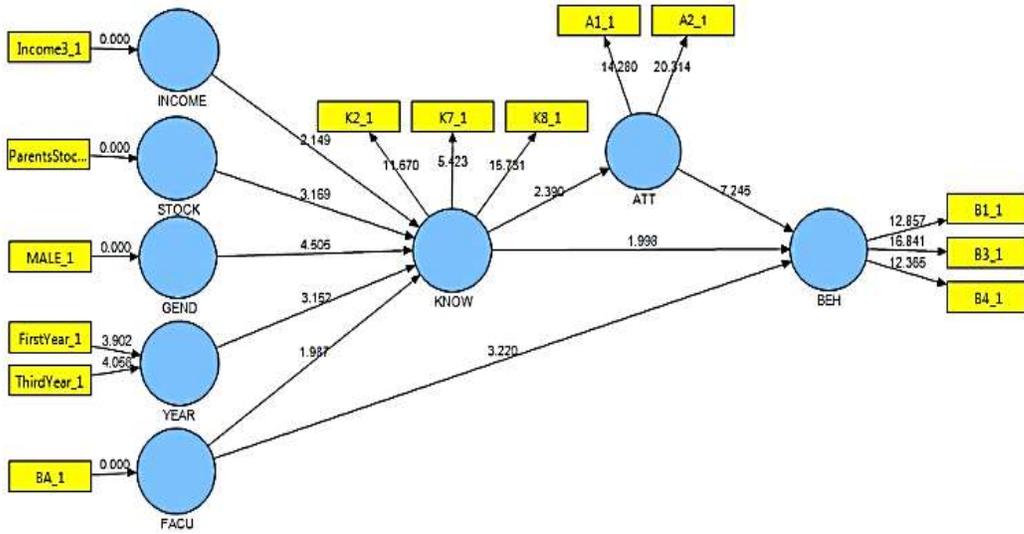
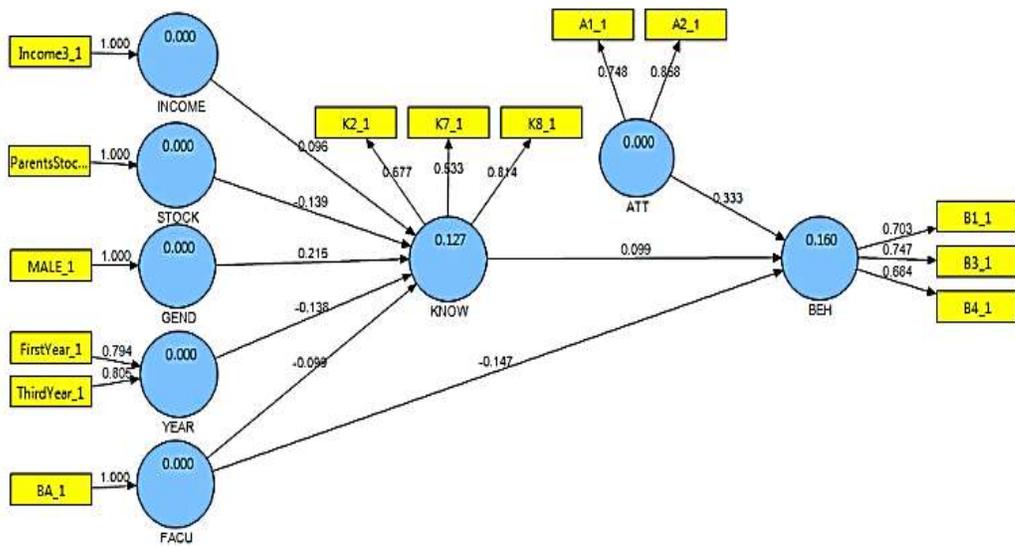


Figure 4. PLS Model- PLS Algorithm



Discussion

This study was undertaken to assess levels of financial knowledge, attitude and behaviour of university students and identify which variables impacted these financial domains. Additionally, this study was conducted to create a conceptual model of several socio-demographic factors, financial knowledge, attitude and behaviour and to show how these variables are connected. The focus was to discover factors that contribute to differing levels of the three financial domain factors and identify how much of the variance could be explained by these factors.

We found that the three components of financial literacy are connected. Several social and demographic factors were found to directly influence knowledge. Knowledge and attitudes were found to directly influence behaviours. This creates an indirect link from the socio-demographic factors to behaviours. The influence between the three financial domains reinforces the idea that financial literacy and financial knowledge are not interchangeable.

A second significant finding was the relatively small impact that knowledge has on behaviour compared to attitudes. While many earlier papers had suggested that knowledge has a significant relationship to behaviour, recent research by Fernandes, Lynch and Netemeyer (2014) suggests these findings may have been due to poor research design. Our findings suggest that research focused on changing attitudes may hold the promise for a larger impact on behaviour. As such, further research and efforts to increase financial literacy should pay closer attention to this relationship and perhaps attempt to address and alter financial attitudes to achieve more positive behaviours.

Conclusion

This study has found that the differences in levels of financial literacy may be partially due to socio-demographic factors. These factors may create inequalities in learning opportunities that affect the ability of individuals to become more financially literate. In addition, we found evidence that the financial dimensions of knowledge, attitudes and behaviours are connected in a manner consistent with Shim et al's (2009) model. While all three financial domains were found to be connected and influenced to some extent by social and demographic factors, our findings must be viewed with caution as we tested only a portion of the Shim et al (2009) model. Future work could be conducted to see if these findings apply to other populations or age groups.

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